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PCM™

Vol. 1 No. 2

THE PORTABLE COMPUTING MAGAZINE

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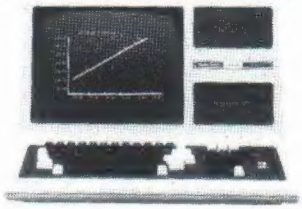

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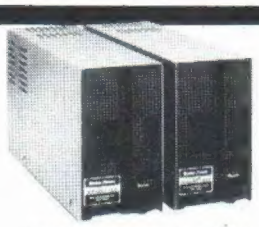

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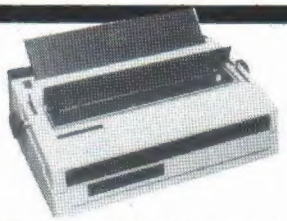

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SUBMIT TO US— AND WE'LL GIVE YOU AN EVEN BETTER MAGAZINE

We're really gratified by the initial response to *PCM — The Portable Computing Magazine*. We've received quite a number of letters, a bunch of telephone calls and — from the business perspective — a whole lot of subscriptions to our publication. So, as you can see, we're growing already.

One of the things which we are really eager to have is reader input. We like to know what you need, what you think about products and what you are using your Portable Computer to do. We will publish your letters if you like, but if you just want to communicate with us on a not-for-publication basis, please do not hesitate to do so.

Also, in our experience in the computer magazine field, we have found that it is people like you who develop the most interesting applications. Of necessity, *PCM's* first issue was put together with contributions from people we already knew who had Portable Computers. But, as we grow, we very much want to expand our base and our information. So please, don't be shy or hesitant about sending us programs, hints or tips you have written and which work for you. Not only will we use them, we'll pay you for them.

Do contribute. We want you to be a part of us. That way we can grow and you can, too.

Generally, we like to have submissions typed (or printed out on a printer) double-spaced. If you want, include a file that can be loaded into the Model 100 and run out by us. But, do make a "hard copy" as well, just in case something goes wrong.

If your submission includes a program, please make several saves, including an ASCII save (accomplished by typing *SAVE "Filename",A)* and be sure to leave space between the saves. We'll handle the format. And, it is helpful to have your text contain some explanation of how the program works.

We ask this because most people learn by doing. What may seem simple to you may not be understood by someone else. In addition to helping someone with a programming application they can use, you will also help them understand a program to the extent that it will be easier to write their own.

Submissions can be sent to "Submissions Editor, *PCM*, 9529 U.S. Highway 42, P.O. Box 209, Prospect, KY 40059." We will notify you when your submission arrives and give you an estimate as to when you will hear if we plan to use it. *Please* do not submit a program to more than one publication at a time. It can cause some real problems.

By the way, you continue to own any program which you submit to us — even if we run it. You have the right to do whatever you wish with it (after a short period of time) so this is not an all-or-nothing situation.

SO, if you have an interesting application or program, do send it along.

You may have noticed the reference to "PoCo" on the cover of July's premier issue. It *does* seem that computers get nicknames and we have sort of adopted PoCo as the one for the TRS-80 Model 100 Portable Computer. One of the reasons for that is that the "formal" name is quite long, and we can save a bunch of space in *PCM* by using a nickname. Another reason, frankly, is because we believe the people at Radio Shack have done a good job of making the Portable Computer user-friendly. And a friendly computer should have a nickname.

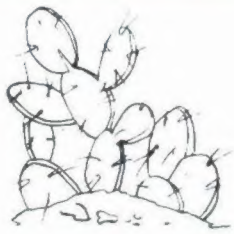
Why "PoCo?" Well, poco means "small" in Spanish, and the PoCo is certainly small (but powerful). Second, it is a friendly-sounding name.

But, if you don't like PoCo, let us know. We're not wedded to a particular name, we just want to use one that will have good recognition, be easy to say and have some very positive connotations for the 100.

Besides, as PoCo expands, with different configurations and the like (although none are expected right now), PoCo gives it a sort of generic name. By the way, that is one of the reasons we didn't name *PCM* something like "100 Magazine," we expect the Portable Computer to grow and expand and—perhaps—grow through several names in what we anticipate will be a long life.

Speaking of which, we *do* want you to know you are far from alone. Although Radio Shack does not release specific sales figures, we understand PoCo sales have been very brisk. This is important to you, because it means more and more software and hardware vendors will be attracted to the Portable Computer market. And, it also means Tandy will devote more of its energies to support for our PoCo.

(continued on page 30)



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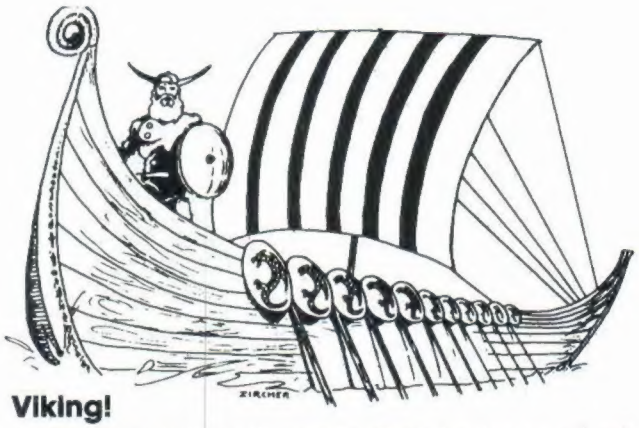
Monsters & Magic

The most realistic fantasy role-playing game yet for the Color Computer. You start out by rolling up your character's basic ability scores and buying equipment. When you are ready it's into the dungeon. Your character starts at first level, but can rise in levels by garnering experience in the fray. If you have role-played fantasy games you will be amazed at the realism of the combat system. Armor class, initiative, and damage by weapon type are all included, with over 50 different monsters to fight - each with it's own abilities. As you rise in level you can win treasure and find magic weapons and spells - if you live!! You set the game length by telling how many monsters you want to fight before you reach your final battle to the death against the powerful Dungeon Lord. There are 1000+ place description combinations in this text based game, and real excitement in every one! This is a fantasy simulation, and is truly not like any adventure game you have ever seen. For 1 player. **$19.95 tape—24K**

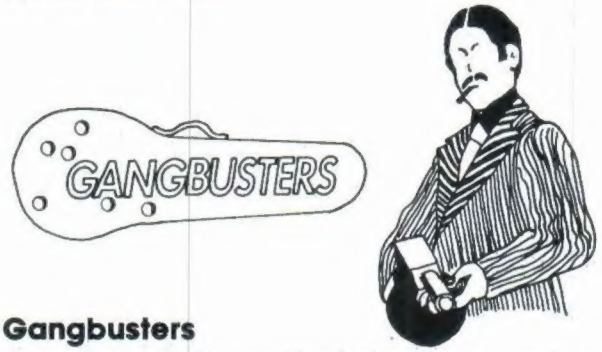
Astrology

Truly a classic, this program will accurately cast your complete horoscope. You just enter the date, time, and place of birth. The sun sign, rising sign, mid heaven (MC), lunar nodes, and planetary influences including houses and aspects between the planets will all be calculated, and a full chart drawn. You can also do progressed charts and transits. It will even tell you the day of the week you were born. The accompanying book will help you interpret this chart of your horoscope. The extent of the documentation is tremendous, even by our exceptionally high standards, and no previous knowledge of the subject is required. You can share in this wisdom which has been used for thousands of years in many cultures. This program was written by a professional Astrologer. **$34.95 tape — 16K**



Viking!

A simulation for 1 to 4 persons. Each begins as a landowner, and by farming their land, buying and selling land, expanding their fishing fleet, building on to their manufactory, increasing their population, equiping and training more soldiers, and regulating their taxes, each player tries to increase their economic power and rank until one becomes ruler over all. But beware plagues, rats, raiders, revolts, bad weather, and other misfortunes which may lie along the road to success. As you progress, see the map of your holdings increase. Playable in 1 to 2 hours, and different every time, you may have an addiction problem. **$19.95 tape — 24K**



Gangbusters

If you ever wanted to try a life of crime, this is your chance. You will start out as a Punk, but by using brains, and a little muscle, you can rise to become a Hood, Runner, Bookie, Torpedo, Fence, Kingpin, or win by becoming Syndicate Boss. Indulge yourself. Bribe a judge, or the District Attorney. Pay off the Cops. Take out a contract on another player, but watch out, they may be after you. Buy trucking companies, bootleg operations, houses of ill fame, but remember, if you get caught, you may do some hard time. Do you have what it takes to take over? This game will keep you close to your rod, get you thinking about bulletproof glass in your car, and definitely bring out the worst in you, but you'll love every minute of it. For 2 to 6 players, takes about 2 hours to play. Every game is excitingly different. **$19.95 tape — 24K**

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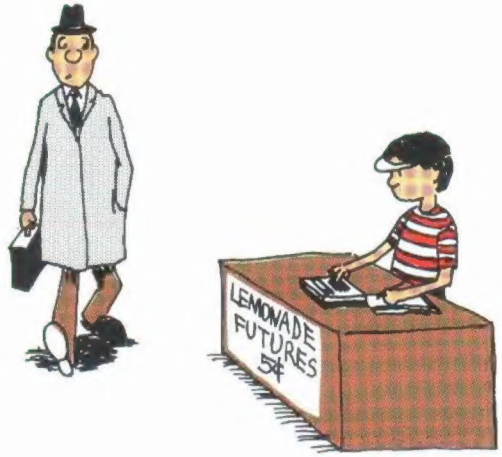
Determining Gross Profit Margins

By Vincent Lord



In the operation of a business, particularly a service or retailing business, operating ratios become vital to its daily health. Management will usually try to obtain a gross profit on sales or gross margin to ensure that all goods are fairly priced to ensure profitability. The gross margin is related to the sales figure; sometimes it is also referred to as the average mark-up percent on sales. For example, if an item is purchased for $100 and sold for $250, then the profit ($150) divided by the sale price gives the gross margin (60 percent). The program listed below will calculate the gross margin, selling price, or cost of goods depending on which data items are available. The gross margin must be a number between 1 and 100 percent (you can't sell something, theoretically, with no cost unless you have a better deal than 1). This program will also help you to determine how to price your goods if you wish to mark down the price and still make some profit (type in 1,3 at the menu). All data from the menu must be separated by a comma and be limited to just two numbers.

(Vincent Lord has a degree in Chemistry from the University of Tennessee and has done extensive work with using computers to operate gas and liquid chromatographs.)

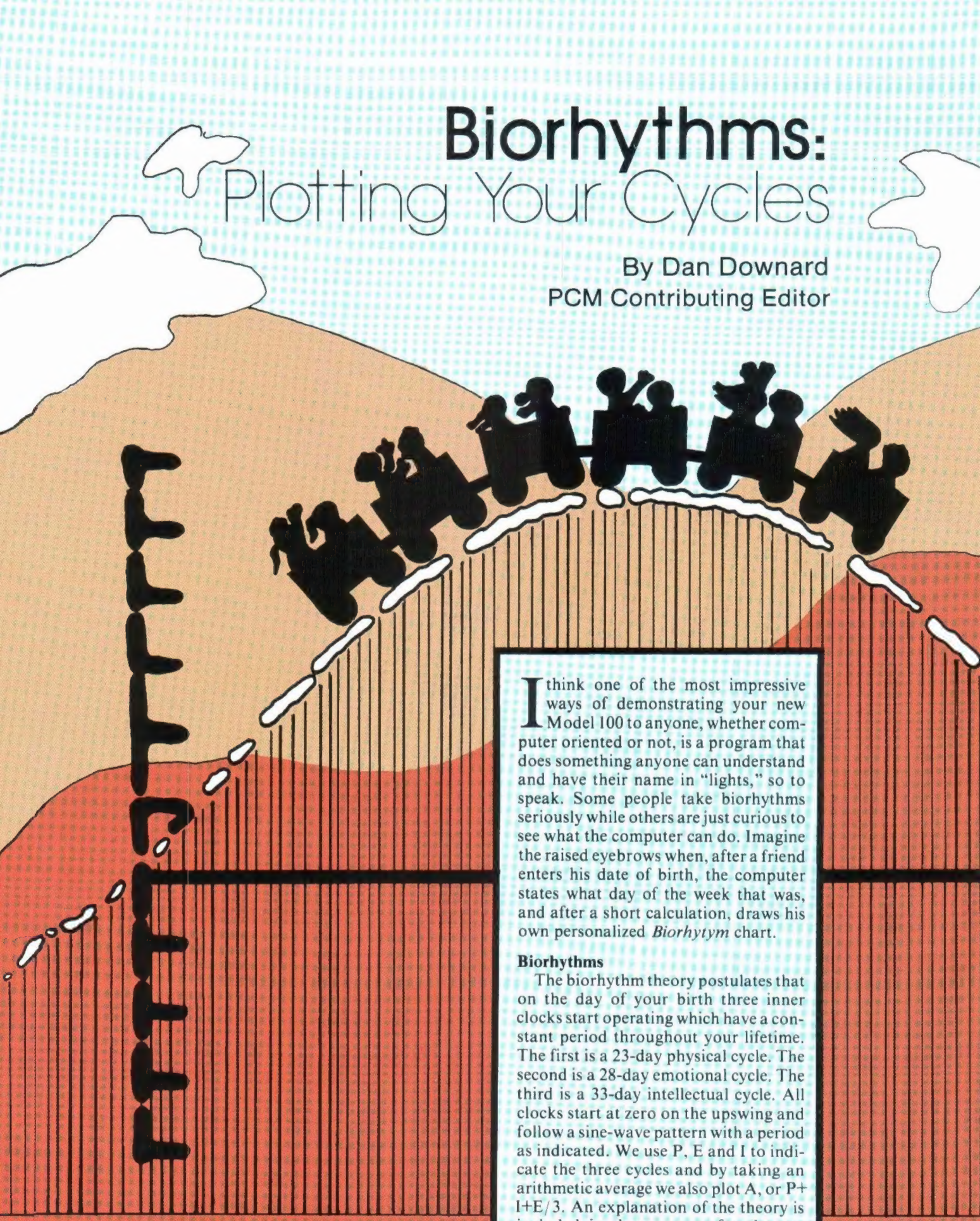
The listing:

```
10 CLS:PRINT"THIS PROGRAM WILL COMPUTE Y
OUR GROSS    PROFIT MARGIN, SELLING PRIC
E, OR COST."
20 PRINT"  <ENTER> TO CONTINUE";
30 INPUT D$
40 CLS:PRINTTAB(12);"**** MENU ****"
50 PRINT:PRINTTAB(10);"1-COST":PRINTTAB(
10);"2-SELLING PRICE":PRINTTAB(10);"3-GR
OSS PROFIT MARGIN"
60 PRINT:PRINT" TYPE NUMBERS OF DATA AVA
ILABLE"
70 PRINT"(2 NOS. SEPARATED BY COMMA)";
80 INPUT A,B
90 IF A=1 OR B=1 THEN 100 ELSE 340
100 IF A=2 OR B=2 THEN 110 ELSE 240
110 IF A=3 OR B=3 THEN 120 ELSE 150
120 PRINT"NUMBER (1 TO 3) ONLY":GOTO 60
130 PRINT:PRINT"Try Another (Y/N) : ";
140 A$=INPUT$(1):IF A$="Y" OR A$="y" THE
N RUN ELSE IF A$="N" OR A$="n" THEN MENU
 ELSE 140
150 REM***COMPUTE GROSS PROFIT MARGIN***
160 CLS
170 INPUT"COST";CO
180 INPUT"SELLING PRICE";SP
190 GP=(SP-CO)/SP*100
200 CLS:PRINT"WITH A COST OF $";CO
210 PRINT"AND A SELLING PRICE OF $";SP
220 PRINT:PRINT"THE GROSS PROFIT MARGIN
IS";:PRINTUSING"###.##";GP;:PRINT"%"
230 GOTO130
240 REM***COMPUTE SELLING PRICE***
250 CLS
260 INPUT"COST ";CO
270 INPUT"GROSS PROFIT MARGIN (1-100%)";
GP
280 IF GP<1 ORGP>100 THEN PRINT"INCORREC
T (1 TO 100)":GOTO 270
290 SP=CO/(1-GP/100)
300 CLS:PRINT"WITH A COST OF $";CO
310 PRINT"AND A GPM OF";GP;"%"
320 PRINT:PRINT"YOUR SELLING PRICE IS";:
PRINT USING"$$#######.##";SP
330 GOTO130
340 REM***COMPUTE COST***
350 CLS
360 INPUT"SELLING PRICE ";SP
370 INPUT"GROSS PROFIT MARGIN (1-100%)";
GP
380 IF GP<1 OR GP>100 THEN PRINT"INCORRE
CT (1 TO 100)":GOTO 370
390 CO=SP-(SP*GP/100)
400 CLS:PRINT"WITH A GPM OF ";GP;"%"
410 PRINT"AND A SELLING PRICE OF $";SP
420 PRINT:PRINT"YOUR COST IS ";:PRINTUSI
NG"$$#######.##";CO
430 GOTO130
```

PCM

Biorhythms: Plotting Your Cycles

By Dan Downard
PCM Contributing Editor



I think one of the most impressive ways of demonstrating your new Model 100 to anyone, whether computer oriented or not, is a program that does something anyone can understand and have their name in "lights," so to speak. Some people take biorhythms seriously while others are just curious to see what the computer can do. Imagine the raised eyebrows when, after a friend enters his date of birth, the computer states what day of the week that was, and after a short calculation, draws his own personalized *Biorhytym* chart.

Biorhythms

The biorhythm theory postulates that on the day of your birth three inner clocks start operating which have a constant period throughout your lifetime. The first is a 23-day physical cycle. The second is a 28-day emotional cycle. The third is a 33-day intellectual cycle. All clocks start at zero on the upswing and follow a sine-wave pattern with a period as indicated. We use P, E and I to indicate the three cycles and by taking an arithmetic average we also plot A, or P+I+E/3. An explanation of the theory is included in the program for the uninitiated.

Biorhythms is a program that I used on several different computer systems and downloaded to the Model 100 from my TRS-80C, or CoCo. CoCo to PoCo. How about that? Information is given in the Portable Computer manual for downloading and uploading to a Model II and Model III, but no mention of a Model C . . . A simple patch cord is all that is necessary.

Following are the connections:

M-100	**TRS-80C**
RS-232C(DB-25P PLUG)	SERIAL I/O (4-PIN DIN PLUG)
PIN 2	to PIN 2
PIN 3	to PIN 4
PIN 7	to PIN 3

On the TRS-80C end I was using *SuperColorTerm* by Nelson Software. Any similar program having a buffer will work. Following is a step-by-step layout of the procedure:

1) Load the program to be downloaded from tape, or disk, into the terminal on the CoCo.
2) Position the cursor on *TELCOM* and hit ENTER.
3) Hit F3 and the screen will respond "Stat" to which you respond 37E1E and ENTER. This initializes the PoCo at 300 Baud, even parity, 1 stop bit and XON/XOFF.
4) After the "Telcom:" prompt hit F4 for Term to which the PoCo will respond with a flashing cursor.

5) Enter F2 for downloading to which the PoCo will respond "File to Download?" Enter a name and extension such as *BIOSIN.BA* followed by ENTER.
6) Send the contents of the CoCo buffer with whatever command is necessary. In my case it was the right arrow key.
7) After the program is received hit F8 to which the PoCo responds "Disconnect?" Answer Y for yes, followed by ENTER.

The file you downloaded will now be in the PoCo memory for whatever purpose you desire.

Program Modification

Actually very few modifications were necessary for program operation. Besides the necessity of changing all of the PRINT@ and PRINTTAB commands the program worked the first time it was executed. At the same time many hours were spent converting these statements into final form for the listing that accompanies this article. Again, most of the time was spent converting screen formats from 80 x 24 to 40 x 8. I should mention here that the CoCo version was initialized for printer output. If printer output is desired change the PRINT commands in lines 530 through 1580 to LPRINT and you will have hard copy.

Summary

One of the most desirable attributes of the PoCo is Microsoft BASIC. You will find that programs written in BASIC for TRS-80s, Apples and IBM PCs will run with a minimum of conversion due to the fact that Microsoft wrote the BASIC system for all of these computers. Usually just a few changes to the screen format is all that is necessary. Good luck and happy computing.

The listing:

```
100 CLS
110 PRINT@50,"BIORHYTHM"
120 PRINT@90,"PCM MAGAZINE"
125 PRINT@130,"AUGUST 1983"
130 INPUT"DO YOU WANT AN EXPLANATION OF
BIORHYTHMS(Y/N)";A$
150 DIMO$(70):DIMR(15):DIMT$(12):DIMF(12
):DIMJ(2)
160 FOR K=1TO8
170 READ T$(K)
180 NEXT K
190 DATA SUN,MON,TUE,WED,THU,FRI,SAT," "
200 READ K
210 FOR R=1 TO 12
220 READ F(R)
230 NEXT R
240 DATA 6.283185,31,28,31,30,31,30,31,3
1,30,31,30,31
260 CLS
270 INPUT"WHAT IS YOUR NAME";Z$
280 PRINT"ENTER DATES IN THE FORMAT MONT
H,DAY,YEAR"
290 PRINT"FOR EXAMPLE-AUGUST 15,1946 WOU
LD BE 8,15,1946"
300 INPUT"BIRTHDATE";M1,D1,Y1
305 M2=M1:D2=D1:Y2=Y1
310 GOSUB1070
315 P1=P2
320 INPUT"START DATE FOR CHART";M2,D2,Y2
330 GOSUB1070
340 INPUT"HOW MANY DAYS DO YOU WANT PRIN
TED";L
350 IF A$="Y" THEN GOSUB 1240
360 X=M1
370 GOSUB1180
380 J1=J2+Y1*365
390 IF J1<639723 THEN P1=8
400 X=M2
410 GOSUB1180
420 J2=J2+Y2*365
430 IF J2<639723 THEN P2=8
440 O=J2-J1+4*INT((Y2-Y1)/4-INT((Y2-Y1)/
4))
450 IF Y1/4-INT(Y1/4)<>0THEN500
460 IF Y2>Y1 THEN 490
470 IF M2>2 THEN 490
480 GOTO500
490 IF M1<3 THEN O=O+1
500 CLS
530 PRINT"BIORHYTHM CHART FOR ";Z$
550 PRINT"BORN ON ";T$(P1);" ";M1;"/";D1
;"/";Y1
560 PRINT"BEGINNING ";T$(P2);" ";M2;"/";
D2;"/";Y2
580 PRINT"P=PHYSICAL          (23 DAYS)"
590 PRINT"E=EMOTIONAL         (28 DAYS)"
600 PRINT"I=INTELLECTUAL      (33 DAYS)"
610 PRINT"A=OVERALL AVERAGE"
620 FOR T=1TO2000:NEXTT:CLS
630 PRINTTAB(12);"DOWN";TAB(22);"CRITICA
L";TAB(37);"UP"
640 PRINTTAB(12);"-------------.--------
-----"
650 IF Y2/4-INT(Y2/4)=0 THEN F(2)=29
670 L=O+L
680 C=0
690 FOR O=0 TO L-1
700 C=C+1
710 FOR P=0 TO 26
720 O$(P)=" "
730 NEXT P
740 O$(13)="."
750 Y=0
760 X=(SIN(K*(O/23-INT(O/23)))*13.5)+13
770 O$(X)="P"
780 Y=Y+X
790 X=(SIN(K*(O/33-INT(O/33)))*13.5)+13
800 O$(X)="I"
810 Y=Y+X
820 X=(SIN(K*(O/28-INT(O/28)))*13.5)+13
830 O$(X)="E"
840 Y=(Y+X)/3
850 O$(Y)="A"
```

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```
860 PRINTT$(P2);TAB(4);M2;"/";D2;TAB(12)
;
870 FOR P=0TO26
880 PRINTO$(P);
890 NEXT P
900 PRINT
910 IF P2=8 THEN 1060
920 P2=P2+1
930 IF P2>7 THEN P2=1
940 D2=D2+1
950 IF D2>F(M2) THEND2=1:M2=M2+1
960 IF M2<13 THEN 980
970 M2=1:Y2=Y2+1
980 IF Y2/4-INT(Y2/4)<>0 THEN 1010
990 F(2)=29
1000 GOTO 1020
1010 F(2)=28
1020 NEXT O
1060 END
1070 'FIND DAY OF WEEK
1080 N1=M2+12*INT(.6+1/M2)
1090 N2=Y2-INT(.6+1/M2)
1100 N3=INT(13*(N1+1)/5)
1110 N4=INT(5*N2/4)
1120 N5=INT(N2/100)
1130 N6=INT(N2/400)
1140 N7=N3+N4-N5+N6+D2-1
1150 P2=N7-(7*INT(N7/7))
1160 P2=P2+1
1170 RETURN
1180 'FIND  DAYS EXPENDED IN PRIOR MONTH
S
1190 J2=0
1200 FOR I=1 TO X-1
1210 J2=J2+F(I)
1220 NEXT I
1230 RETURN
1240 CLS:PRINT"  THE BIORHYTHM THEORY PO
STULATES THAT"
1250 PRINT"THERE ARE CERTAIN METABOLIC C
YCLES,"
1260 PRINT"KNOWN AS INNER CLOCKS, WHICH
HAVE A"
1270 PRINT"CONSTANT PERIOD IN THE HUMAN
BODY."
1280 PRINT"THE THREE MAIN CYCLES ARE A 2
3 DAY"
1290 PRINT"PHYSICAL CYCLE, A 28 DAY EMOT
IONAL"
1300 PRINT"CYCLE, AND A 33 DAY INTELLECT
UAL CYCLE."
1305 FOR T=1TO3000:NEXTT:CLS
1310 PRINT"THE PHYSICAL CYCLE IS ASSOCIA
TED WITH"
1320 PRINT"PHYSICAL VITALITY, ENDURANCE
AND"
1330 PRINT"ENERGY LEVEL.  THE EMOTIONAL
CYCLE"
1340 PRINT"CORRESPONDS TO SENSITIVITY, I
NTUITION"
1350 PRINT"AND CHEERFULNESS.  THE INTELL
ECTUAL"
1360 PRINT"CYCLE IS RELATED TO MENTAL AL
ERTNESS"
1370 PRINT"COGNITIVE POWER AND JUDGEMENT
 ABILITY."
1375 FORT=1TO3000:NEXTT:CLS
1380 PRINT"  ALL THREE CYCLES START AT Z
ERO ON"
1390 PRINT"THE UPSWING AT THE MOMENT OF
BIRTH."
1400 PRINT"AND CONTINUE UNBROKEN THROUGH
OUT A"
1410 PRINT"PERSON'S LIFETIME."
1420 PRINT"  ACCORDING TO BIORHYTHM THEO
RY, THE"
1430 PRINT"HIGH PERIODS OF A CYCLE ARE T
HE TIMES"
1440 PRINT"WHEN A PERSON WILL PROBABLY H
AVE THE"
1445 FORT=1TO3000:NEXTT:CLS
1450 PRINT"MOST ENERGY, BE MOST CHEERFUL
,"
1460 PRINT"MENTALLY SHARP, OUTGOING AND
ALERT."
1470 PRINT"THE LOW PERIODS CAN BE REREGA
RDED"
1480 PRINT"AS RECUPERATIVE TIMES, WHEN T
HE BODY"
1490 PRINT"IS RECHARGING ITS BATTERIES.
 THE"
1500 PRINT"DAYS ON WHICH ANY CYCLE CROSS
ES THE"
1510 PRINT"ZERO LINE ARE CALLED *CRITICA
L DAYS*"
1515 FORT=1TO3000:NEXTT:CLS
1520 PRINT"AND PERFORMANCE MAY BE UNSTAB
LE."
1530 PRINT"  THESE IDEAS ARE PRESENTED W
ITHOUT"
1540 PRINT"ANY STATEMENT THAT THEY ARE F
ACT."
1550 PRINT"HOWEVER, THERE THERE ARE THOS
E WHO"
1560 PRINT"LIVE THEIR LIVES BY THEIR *BI
ORHYTHM*"
1570 PRINT"CHART.  HERE IS YOUR CHART FO
R YOUR"
1580 PRINT"OWN EXAMINATION:"
1585 FORT=1TO3000:NEXTT:CLS
1590 RETURN
1600 END
```

PCM

RANDOM FUNCTION WILL REQUIRE SOME FIGURING

One of the more interesting things you can do with your Portable Computer is generate random numbers. These can be very useful for a number of applications; however, it takes a little insight into the random number process in order to handle random numbers correctly.

Actually, there are two particular points to consider with random number generation. The first is to determine the real *randomness* of the random number and the second is to determine the range of random numbers you want to generate.

Before we get into a discussion and some examples of how to make random numbers work, you might want to think about what good are these things, anyway.

The nicest thing about random numbers is that they are, well, random. You never know what they will come up with next. So, one thing you can do with them is simulate the roll of a pair of dice. We'll have a program to show you how that is done later on.

An application like this, especially with the Portable Computer's portableness, is endless. But, one certainly would be in playing board games. Just get your trusty Portable Computer, some game, and throw the dice away. A short program in BASIC can easily take over the dice-rolling chores—and you won't have to shake your hand back and forth all afternoon, either.

There are countless other applications that can be used with random numbers. We'll try not to spoil all the fun, but games—especially simulations where you want to have a probability of some event occurring—comes most clearly to mind.

Keeping those uses most firmly in mind, here is how to make your Portable Computer's random number generator work for you:

TRUE RANDOMNESS

The main problem, my friend, in making up true random numbers is that no computer, in and by itself, provides a *real* random number. If you don't believe this (would we lie?) simply write a little program like this:

```
10 FOR X=1 TO 5
20 PRINT RND(1)
30 NEXT X
```

What we have constructed here is a FOR/NEXT loop to make the computer find and print out five random numbers. RUN the program and you will see five different numbers (all of them less than one, but we'll handle that later) which *appear* to be random—they certainly don't seem to have any pattern to them!

Well, just go back to the Main Menu, turn your Portable Computer off, and then turn it on again. Go back to BASIC and RUN the program again.

Gads! What's this? Yes, they are the *same* random numbers you got before.

These numbers don't appear to be so random after all. I mean, if you wanted to bet on a certain number coming up, why that would be pretty easy, since you know what the random numbers are.

The reason this happens is because what the Portable Computer generates—or any computer for that matter—is a *pseudo random* number. If you ran the example program above a second time *without* turning the computer off, you would get some different numbers. But, once you do turn it off, the computer re-seeds its random number generator and that brings up the same set of numbers again.

You can defeat this by changing the seeding function. And the best way to

do this is through the TIME$ function. Since time is always changing, so is your TIME$. There is a short, simple and easy explanation in the manual which came with your Portable Computer that shows how to do this, but, for our purposes here, it needs a little bit of modification.

So, we need to add a Line 5 to our program above, like this:

```
5 S=VAL(RIGHT$(TIME$,2)): FOR I=1 TO S: D=RND(1): NEXT I
```

What this confusing bit of mish-mash does is seed the random number generator to the seconds part of the TIME$, the part which changes the fastest. You then end up with 60 different possible "starting points" for the pseudo random number generator. That makes it pretty random—and certainly unpredictable.

"REAL NUMBERS"

So, what are those silly numbers, anyway? How can you roll dice with a bunch of decimal numbers? I mean, have you ever seen any *negative dice*?

This represents one of the things we *do* dislike about the Portable Computer. Honestly, it's no big thing. But, to get what you might call "real" numbers out of the random number generation process, you have to do a little bit of program writing. It would have been less difficult to have put the code into the instructions used to write the microprocessor. Oh well. As we said, it isn't any big deal.

In order to get "real" numbers we have to introduce you to a new friend in the BASIC programming language, INT. This is the function which produces an INTeger of a number. And, that is going to be important in our quest to get "real" random numbers.

Let's continue to use the example of rolling dice. And, for now, we'll just ignore the necessity of fixing the random number generator seed. But, what we *do* need to do is write something that will give us those normal numbers we want.

NEW out the program you had in memory before and try this line:

```
20 PRINT INT(6*RND(1))+1
```

Aha! Prints a whole number, doesn't it! And, the whole number is between one and six.

The key to this little bit of wizardry is the "6" after the open parenthesis and before the asterisk (a "times sign" in BASIC). The six simply is the range of numbers you want. Since a single die has six sides, we used six. If you wanted to get a random number between one and 100, you would substitute "100" for "6" in the line above.

"The laws of probability tell you (and so will any friendly pit boss in Las Vegas or Atlantic City) that there is a better chance of rolling a seven on two dice than there is in rolling a, say, four. That, frankly, is the basic foundation to the game of craps."

Simple enough, eh wot?

We *do* have to add one, which we do at the end of the line, because we are still generating numbers between zero and one. The multiplier takes care of the range we want, but because we are generating numbers that are less than one, we have to add one.

And it is the integer function which drops the decimal point and all the numbers after it, once the multiplication is complete.

So, to roll a die five times, as we tried to do earlier, we would simply write this program:

```
5 S=VAL(RIGHT$(TIME$,2)): FOR I=1 TO S: D=RND(1): NEXT I

10 FOR X=1 TO 5
20 PRINT INT(6*RND(1))+1
30 NEXT X
```

What you will see is a list of five random whole numbers. Simple as can be.

A BIT DICEY

Now that we have solved the basic problem of getting whole random numbers, we're ready to write a program that will roll dice for us.

Oh, that's simple, you say. Just change the "6" in Line 20 to a "12" and you've got it. Right?

Wrong.

The laws of probability tell you (and so will any friendly pit boss in Las Vegas or Atlantic City) that there is a better chance of rolling a seven on two dice than there is in rolling a, say, four. That, frankly, is the basic foundation to the game of craps.

Well, you ask, if you have an "equal" chance of rolling any single number with two dice, why don't you just use a random of 12 to do it?

The reason is simply because you are not rolling one twelve-sided die, you are rolling two six-sided dice. With *each* die, the chances of any one number coming up are equal.

But, there are more *combinations* that equal seven than any other. And, since you are using two dice, it is the combinations that are important.

So, if we are going to write a dice-rolling program, we have to take these combinations into account.

And the way we do that is to roll two dice, like this:

```
5 S=VAL(RIGHT$(TIME$,2)): FOR I=1 TO S: D=RND(1): NEXT I

10 FOR X=1 TO 5
20 A=INT(6*RND(1))+1
30 B=INT(6*RND(1))+1
40 C=A+B
50 PRINT C
60 NEXT X
```

Now, key this one in and RUN it. What you will have is five random whole numbers between two and twelve, each one representing a roll of the dice.

By adding a randomizing factor as in Line 5, you can come up with true random dice rolls. You might, if playing a game, want to eliminate Lines 10 and 60, so that only one roll is made at a time. All you have to do is type in RUN every time you want to roll the dice.

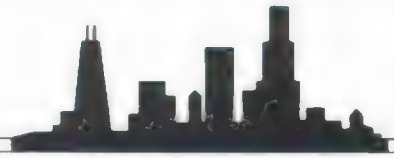
As a final little "bell and whistle" to this, let's take out Lines 10 and 60 and add the following line:

```
60 R$=INKEY$:IF R$="" THEN 60 ELSE 20
```

We won't go into a lot of detail on this, except to say that your new Line 60 checks the keyboard to see whether *any* key is pressed. If one is, it rolls the dice again and then waits for another key to be pressed. To roll the dice, just press any key you wish.

There are a great number of other applications you can use with dice, and with random numbers. If you have one you'd like to share, send it to us and we'll print it.

PCM



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Try Your Hand at *Blackjack* It's a Good Deal for Dull Moments!

Program By
Robert Frowenfeld

There will be times, of course, when you have finished all the work you were doing with your text processor, calculated and formatted all the input values with your spreadsheet program, and shipped the whole, wonderful, electronic distillation of your dedicated efforts to the home office via the magic of *TELCOM*. Then what? Well, if you had the foresight to have anticipated this moment, assuming that you have no great excitement planned and waiting, you might have keyed in this dandy little version of Blackjack so that you could now unwind by trying to beat the "house" at a few hands.

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So, go ahead. Anticipate that lull in the day's schedule, and key this one into memory. You can't lose. Or can you?

The listing:

```
1 CLS:GOTO10
2 SE=VAL(RIGHT$(TIME$,2))*VAL(DATE$):FOR
I=1TOSE:DU=RND(1):NEXTI:FORI=1TO52:X(I)=
0:NEXTI
3 VL(1)=RND(1)*52+1:X(VL(1))=1:I=1
4 PRINT@151,I;:I=I+1:IFI=53THENRETURN
5 X=RND(1)*52+1
6 IFX(X)=1THEN5
7 VL(I)=X:X(X)=1:GOTO4
10 CLEAR200:DEFINTA-Z:DIMVL(52),X(52)
15 VL$="A234567890JQK"
20 PRINT@46,"Welcome to TRS-80 Blackjack
"
25 PRINT@128,"The rules are simple ..."
27 LINE(27,5)-(210,34),1,B
30 GOSUB800
35 PRINT@45,"The house must draw on any
16":PRINT@126,"and must stick with any 1
7":GOSUB800
40 CLS
50 GOSUB700
60 W(1)=0:W(2)=0
100 'deal cards
105 CLS
107 IFIX>42THENGOSUB700
110 N(1)=0:N(2)=0:FP=0
120 PL=1:GOSUB500
130 PL=2:GOSUB500
140 PL=1:GOSUB500
150 PL=2:GOSUB500
155 HC=VL:HD=VL(IX-1)
160 'check for blackjack
170 PL=1:GOSUB780:IFY=21THENGOSUB750:PRI
NT@40,"You have";:PRINT@80,"Black-";:PRI
NT@122,"jack!";:GOSUB1100:GOSUB760:WI=1:
GOTO1000
```

```
180 PL=2:GOSUB780:IFY=21THENGOSUB750:PRI
NT@200," I have";:PRINT@240,"Black-";:PR
INT@282,"jack!";:GOSUB760:GOSUB1100:WI=2
:GOTO1000
200 'player goes
205 PL=1:GOSUB780:PRINT@40,"You have";:P
RINT@81,Y;
210 PRINT@160,"Card ?";:PRINT@200,"(Y/N)
 ";:A$=INPUT$(1)
220 IFA$="Y"ORA$="y"THEN230ELSEIFA$<>"N"
ANDA$<>"n"THEN210
225 GOTO400
230 PL=1:GOSUB500
240 'evaluate
245 GOSUB780:IFX>21ANDY>21THEN260
250 GOTO200
260 'busted
270 GOSUB750:PRINT@80,"You have";:PRINT@
120,"Busted!";:PRINT@200,"This was";:PRI
NT@240,"my hand:";
280 GOSUB760:WI=2:GOTO1000
400 'computer goes
405 PRINT@160,STRING$(8," ");:PRINT@200,
STRING$(8," ");
410 PRINT@200,"Now its";:PRINT@240,"my t
urn!";:GOSUB1120
415 GOSUB760
420 PL=2:GOSUB780
430 'draw?
445 IFX>16ORY>16THEN485
450 'draw card
455 PL=2:GOSUB500
460 GOSUB780
475 IFX>21THEN490
480 IFX<17ANDY<17THEN450
482 IFX<17ANDY>21THEN450
485 'stick
486 PRINT@200," I have ";:PRINT@240," "Y
"   ";:GOSUB1100
487 GOTO600
490 'bust
495 PRINT@200,"Oh no!  ";:PRINT@240,"I b
usted";:WI=1:GOTO1000
499 GOTO499
500 'get one card from deck
510 CD=N(PL)+1:N(PL)=N(PL)+1:VL=VL(IX):G
OSUB900:IX=IX+1
515 VL=VL-13*INT((VL-1)/13)
517 IFVL>10THENVL=10
518 C(PL,N(PL))=VL
520 T(PL)=T(PL)+VL:RETURN
600 'determine winner
620 PL=2:GOSUB780:S=Y:PL=1:GOSUB780
640 IFY>STHENWI=1ELSEIFS>YTHENWI=2ELSEWI
=0
650 GOTO1000
700 'shuffle
705 PRINT@126,"I'll shuffle the deck ...
";
710 GOSUB2
715 CLS:IX=1
720 RETURN
750 'clear left side
755 FORIR=0TO7:PRINT@IR*40,STRING$(8," "
);:NEXTIR:RETURN
760 'display hole card
765 FP=1:CD=2:PL=2:VL=HD:C=13:LINE(C*6-3
,63)-(C*6+19,63-26),2,BF:GOSUB910
770 RETURN
780 'total either hand
782 GOSUB850
785 X=0:Y=0:FORI=1TON(PL):Z=C(PL,I)
790 X=X+Z:Y=Y+Z:IFZ=1ANDY<12THENY=Y+10
795 NEXTI:RETURN
800 PRINT@285,"Press any key to continue
  ";:A$=INPUT$(1):RETURN
850 'sort hand
860 N=N(PL)-1:FORI=1TON:FORJ=1TON
865 IF C(PL,J)>C(PL,J+1) THEN 880
870 T=C(PL,J):C(PL,J)=C(PL,J+1):C(PL,J+1
)=T
880 NEXTJ:NEXTI
890 RETURN
900 'draw card
905 IFPL=2ANDCD=2THENR=63:GOTO960
910 C=5+CD*4
920 IFPL=1THENR=32ELSER=63
930 IFPL=1THENP=40+CELSEP=200+C
940 V$=CHR$(156+INT((VL-1)/13))
950 PRINT@P,V$;:PRINT@P+82,V$;:A$=MID$(V
L$,VL-13*INT((VL-1)/13),1):PRINT@P+41,A$
;:IFA$="0"THENPRINT@P+40,"1";
960 LINE(C*6-3,R)-(C*6+19,R-26),1,B
963 IFFP=1THENRETURN
965 IFPL=2ANDCD=2THENLINE(C*6-3,R)-(C*6+
19,R-26):LINE(C*6-3,R-26)-(C*6+19,R)
970 RETURN
1000 'end
1005 GOSUB1100
1010 GOSUB750
1015 W(WI)=W(WI)+1
1020 IFWI=1THENPRINT@80,"You Win!";ELSEI
FWI=2THENPRINT@200," Ha Ha  ";:PRINT@240
," I win! ";ELSEPRINT@160," A TIE! ";
1025 GOSUB1100:GOSUB750
1027 PRINT@0,"Score -";:PRINT@40,"You:";
W(1);:PRINT@80," Me:";W(2);
1030 PRINT@160,"Another ";:PRINT@200," G
ame?  ";:PRINT@280," (Y/N) ";:A$=INPUT$(
1)
1040 IFA$="Y"ORA$="y"THEN100ELSEIFA$="n"
ORA$="N"THEN1050ELSE1030
1050 PRINT@160,"Are you ";:PRINT@200," S
ure ?";:PRINT@287,"";
1060 A$=INPUT$(1):IFA$="Y"ORA$="y"THENME
NUELSE100
1100 FORI=1TO2000:NEXTI:RETURN
1120 FORI=1TO1000:NEXTI:RETURN
```

PCM

Let's Get Organized With Our Model 100

By Lawrence C. Falk

In last month's issue we talked about using the sorting program found in your PoCo manual for sorting files created with the *ADDRSS* and *SCHEDL* utility programs which are built in to the Model 100. Now, we want to talk about organizing things through these same files.

Actually, we are not going to be talking about a whole lot of "tricks" in this presentation. Rather, we have developed a few techniques that will allow you to make better use of these two data base-type files and modify them for your own use.

A few definitions first. The first one is one which we have used already, *data base*. You will hear a lot of people talking about data bases and data base managers. All a data base program is, really, is an electronic file system. Some of them, obviously, are better than others and some of them have more bells and whistles than others. The "typical" data base program will allow you to enter data, search through that data and sort the data. Usually, you can also get reports of what is in the data base as well.

Because of their versatility, data base programs are among the most popular of those available for personal computers. That Radio Shack includes *two* of them in their built-in programs attests to that. And, of the commercial software coming to market for the PoCo, each package we have seen includes a data base system.

Another definition about which you should be aware is "search." This, too, is built in to the Portable Computer programs we are discussing. Searching is merely a way that you can look through everything you have in a file and "find" the things you are seeking.

As an example, suppose you had created a file of recipes. And, among the entries you had "Chef Salad," "Caesar Salad," "Garden Salad" and "Spinach Salad." Of course, you have lots of other recipes in there, too — like "Pizza," "Hot Cross Buns," and so on.

But, say, you're ready to plan a meal and need a recipe for a salad. If you know *what* salad you want, you simply search for the full name of the salad. But, if you just want *a* salad, you can search for just the word "salad" and the recipe for all four of them will appear. Then, you can choose which one of them to make.

The ability to do this is built into your two data base programs on PoCo. Assuming you want to use the *SCHEDL* file to hold the recipes, just select that file from the main menu, press the F1 Key for the "Find" option and type in the word *Salad*. You can, of course, get a printout by using the "Lfind" option.

So, searching is merely asking the computer to look through the file and find whatever it is you are looking for.

"Searching is merely a way that you can look through everything you have in a file and "find" the things you are seeking... The ability to do this is built into your two data base programs on PoCo."

Sorting is arranging things in some order. Using the program which appears in the back of the manual, you will be able to sort the entire file (see *PCM July, 1983*). Then, when you go to search, the files will come out in the order specified.

A word of caution: Computers (including your PoCo) sort using something called an ASCII system. That means each letter and number is assigned a value. Numbers have *lower* values than letters, so they come first in a sort. Space (and most punctuation) come before numbers, so they will be at the very top of the list when doing a sort.

Additionally, in sorting, lower case letters have different values than do upper case. Yes, we know this doesn't make a difference when you search with the built-in programs; but it does make a difference when you sort with the program provided in the manual.

If this sounds a bit complicated, it is. But, at the same time, you can put these differences to good use.

(By the way, most data base programs do not change the actual file when they sort, they just do a sort in the computer's memory. That is not how the function works with the built-in programs.)

The final definition we are going to bother you with is *field*. A field is any piece of information. If you want to set up a name and address file, usually you would have a series of entries such as first name, last name, street address, city, state, zip code and telephone number. Each of those elements is considered a *field*.

We will be talking about fields as we move along simply because you will probably run into this term more and more as you get more involved with your Portable Computer. May as well get used to it, as the saying goes.

Using The Files

You do not have to use the two built-in files for the purposes specified, although having the ability to dial a telephone number with the *ADDRSS* file is handy. For that reason, we will talk about the *SCHEDL* file here, yet you do not have to use just that one. You can use *ADDRSS*, too.

We do believe one of the most handy uses for the *SCHEDL* file is the use for which it was intended, as a schedule file. Yet, using non-sorted files can create a problem on the one hand and you can make your schedule much more efficient with a few simple modifications which take some basic computer principles into consideration.

The easiest way to use the *SCHEDL* file is to simply call it up (through *TEXT*) and add or subtract information as you see fit. If you do, you might come up with entries which look something like this:

WEDNESDAY J. JONES MEETING
8/23 FLY TO DALLAS
ZEB - LUNCH AUG 24

Truth: If you use your search function for "Zeb" you will get a display which gives you the information on the luncheon with Zeb. And, if you need to remember when you fly to Dallas, the simple entry "Fly" or "Dallas" will get it for you. This is one of the features we like best in the Model 100's built-in programs.

But, let's just assume you will be meeting Mr. Jones on Wednesday, flying to Dallas the next (the 23rd) and planning to have lunch with Zeb there the next day. After that, you come home. If you sort this file, and then print it out, it will first show the flight to Dallas, then the meeting with Jones and, finally, lunch with Zeb. It will be all messed up and, if you want to take a printout of the schedule of your Dallas trip with you, it can be a mess to figure out. Especially if there are several meetings over several days in several places.

What to do? The most obvious one is to build a little structure into your file.

Structure A Dirty Word?

We're not talking about some big complicated system that is more trouble to keep track of than anything else. All we suggest is a few simple rules which should help you set up your files a little better and, more important, use them much more efficiently.

Rule One is on dates. Make them the first item in each entry. We'll call this the "date field."

For best results, the date field should be the same length in every entry. And, to make it even easier, make the date field in the form Year/Month/Day/Time. So, if you have to meet Zeb at 11:45 on the morning of August 24, make the date field look like this:

84/08/24/1145a

The year is optional, but if you will be entering information which will span between one year and the next, you will want to have the year in there. That is because your Portable Computer will sort January entries (01) before December entries (12).

The slash marks are another option, but they make it easier to read.

You will see here we have established the year to occupy two characters, the month to take up two characters, the day to take up two characters and the time to take up five. If the number you are putting in any area is less than the number of characters needed to fill it, just put in zeroes.

As an example, if it is to be breakfast with Zeb rather than lunch, you would write the time as 0830a. If it is dinner, use 0730p. The "a" and the "p" are for a.m. and p.m.

This format will give you the ability to sort your entire file by date and time. Still, you will be able to search as well; just simply specify how much information you want.

Search A Month

If you wish to know all the appointments you have scheduled for August, just "Find" for 84/08. On the other hand if you need to know appointments for August 22, then "Find" for 84/08/22. Want to know what you will be doing at 11 a.m. every day? Just "Find" for */1100a.*

Next, it is time to enter what you will be doing. We suggest that you go a bit free form on this, as suits your needs. However, there are a few things you might wish to consider.

We enter all airplane flights as *DL #233 TO DALLAS AR 1130a.* The common key here is the "#" symbol. If we are searching to find out plane flights, we can merely "Find" the symbol #. That gets us every flight and, because we have sorted our file, it gives them in order (because of the date field which would have preceeded the above listing).

The *DL* stands for Delta Air Lines. We use TWA for (naturally) TWA, UA for United, AM for American and so on. Also, you'll save space in your file (and memory in your computer) if you use the standard abbreviations for airports (such as DFW in the above). But, you better know these abbreviations.

Since the date field tells us what time the plane leaves, we use *AR 1130a* to tell us what time it arrives. You may not care. We like to know.

For lack of a better term, we call this the *information field.* It does not have to have only flight information in it. It can have meetings, luncheon engagements, appointments and the like.

In order to key in these things, we use a unique symbol for each one as well. For instance, we use *(T)* for telephone calls that have to be made; *(M)* for meetings, and, most important, *(*)* for important things like birthdays and wedding anniversaries. You can search for these specific things by using the unique character.

And, yes, your PoCo has special symbols which both match some of these special needs (like a little telephone) that you can use instead of our symbols. It is just that our symbols work for *us.*

Using these general data base principles will allow you to search and sort more easily. In our next article, we will talk about methods to get printouts which are easy to read and understand using the "Lfind" built-in function.

"Build a little structure into your file... We suggest a few simple rules which should help you set up your files a little better and , more important, use them much more efficiently."

INSIDE AND OUTSIDE

THE MODEL 100

By Bob Rosen

The introduction of the Radio Shack Model 100 echoes in a new generation of microcomputers. For a computer that measures 11¾ inches wide by 8½ inches high by 1⅞ inches deep, it is amazing what it contains. It has a full QWERTY keyboard with normal keys sloped at a slight angle for easy viewing. Besides the usual standard keys, it has an additional 16 function and control keys. Some of the extra keys are GRAPH, CODE and NUM. The NUM key converts the lower right-hand corner keys into a 10-key numeric keyboard. The GRAPH key can be used to show 41 special graphic characters. Thirty-two additional block graphic characters can be displayed by pressing the SHIFT and GRAPH keys along with another key. Even more special characters can be produced by using the CODE key. All keys have automatic key repeat when held down for more than a second. The Model 100 can produce all of the 256 ASCII character set from the keyboard.

The display is a 40-character by 8-line flat LCD screen with a viewing adjustment control on the left side of the case. The control allows you to lighten or darken the display to match any viewing angle. The display is large enough for word processing applications. This is the major complaint about the Epson HX-20 portable computer which has only a four-line, 20-character display. The Model 100 display is large enough to show graphics. Its LCD screen can produce 64 rows by 240 columns of dot-addressable graphics that can be used for charts and graphs.

The Model 100 contains many connectors and switches. On its rear panel are inputs for a serial and parallel printer, telephone modem and cassette recorder. There is also an 8-pin DIN connector to interface the Model 100's built-in direct-connect modem to the telephone line. The parallel printer interface is Centronics compatible and will interface to printers such as Epson, Okidata and C-Itoh. The RS-232 interface can be used both for serial printers and external modems. This will allow you to hoop up an acoustic coupler modem for public and hotel telephones. The Model 100 can be directly connected to another computer through a null modem cable. One can prepare reports from anywhere, be it a bus, plane or train and then transfer it to a larger computer via the phone lines or null modem cable. This one feature is the Model 100's biggest selling point. Salespeople and executives will find the

Model 100 indispensable for their work. Since there is a cassette recorder input, data and programs can be loaded or saved on tape. One can carry much information when traveling with the Model 100.

On the right-hand side of the computer is an on/off switch, LCD display control and a power adapter jack. You can operate the Model 100 via AC, which saves battery life. This can be very useful since maximum battery life is only 20 hours. The battery life of a 32K Model 100 is only five hours! On the left side of the computer is a connector and two switches. The connector is the familiar 9-pin D connector known to all Atari owners. This is the input for a Bar Code Reader. A BCR is used to interpret the black and white bars found on magazines, cans, etc. At the moment, Radio Shack is working on the software and hardware for it. A third-party company, B.T. Enterprises of Bohemia, New York, already is advertising a BCR for the machine. This feature will generate even more sales for the Model 100 once it is fully supported and on the market. The two switches are for modem operation. One is to select the answer or originate mode and the other is for selecting the built-in modem or an external acoustic coupler modem. That covers the outside of the Model 100.

Now onto the inside which is even more impressive. The Model 100 uses a 80C85 CPU as its microprocessor. It is a 8-bit CPU with a clock speed of 2.4 MHz. The 80C85 is a CMOS version of the 8085 CPU. All the chips in the Model 100 are CMOS chips, which require extremely low current drain. Without this low current drain the Model 100 would not be able to retain its memory when the computer is off. It uses Ni-Cad batteries to backup this memory. These batteries are kept recharged from either the AC power supply or the internal four AA batteries. There is a low-battery warning light next to the LCD screen to tell you when the AA batteries need to be changed. The Ni-Cad's will maintain your memory for 30 days for a 8K 100, but only a week for the 32K model. The AA batteries are stored behind one of the two covers located on the bottom of the Model 100.

Moving on to the other cover reveals two very interesting empty sockets. The top socket is for installing additional ROM-based programs such as an electronic spreadsheet. The bottom socket is the expansion port to extend the 40-pin bus of the computer. Radio Shack has not yet officially said what they plan to add to the expansion port but disk drives and a video interface would be strong possibilities. Look for third party companies to capitalize on this expandability.

The Model 100 is available with either 8K or 24K of memory. It can be expanded by plugging in 8K memory modules. Unfortunately, to expand from 8K to 32K could be very costly. At the moment Radio Shack would charge almost $400 for this upgrade. Fortunately, Spectrum Projects is planning to come out with memory upgrades at almost half that price. Further detail will appear in future issues of PCM. Judging from software ads in PCM, business programs such as an electronic spreadsheet will require at least 24K.

In closing, I hope you are now as impressed as I am with this fantastic computer. Until next time, go LOCO with your PoCo! PCM

(Bob Rosen is president of Spectrum Projects and runs three Color Computer bulletin boards.)

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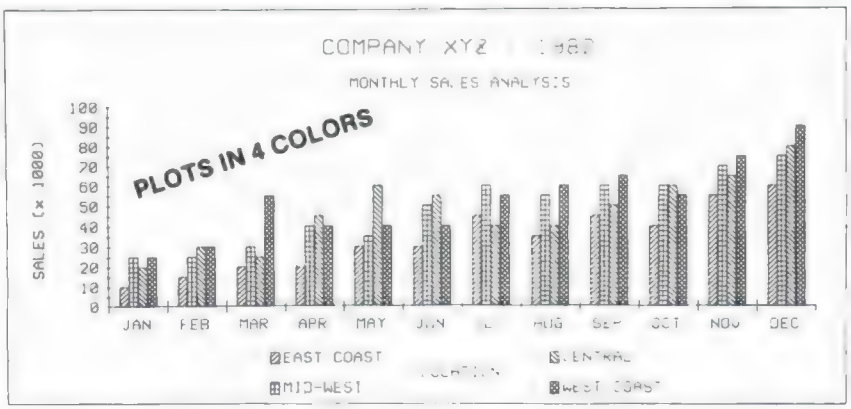

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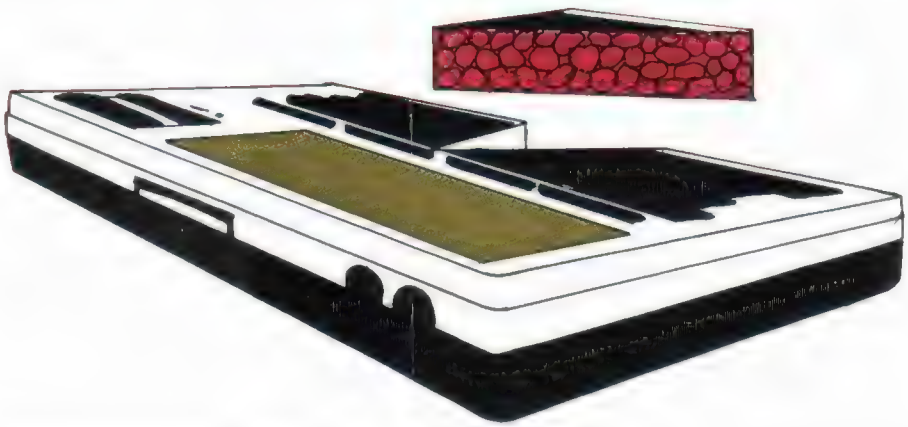
Drawing A Pie Chart On The Screen



By Michael Stanford

(Michael Stanford is director of systems for Portable Computer Support Group, Dallas, Texas)

In the BUSINESSPAK+ group of software for the Model 100 there is an excellent graphics program called *Graph+*. This program works in conjunction with another program in the group called *EXPNS+* that produces a spreadsheet. The *Graph+* program does not write to the screen, but instead prints out on the Radio Shack DMP-100 Dot Matrix printer.

The screen is really too small to produce graphs that are displayable. A graph has its impact in the printed form.

We do, however, recognize some value in screen graphics, if for nothing more than one's own amusement. Therefore, we are providing for you in this article a very enjoyable screen pie chart program, along with a discussion concerning some of the programming logic.

To draw a pie chart we must get the data to be plotted, perform certain operations on it, and cause it to be displayed on the LCD.

In this illustration we will obtain the values to be plotted from the keyboard using the following self-explanatory code, which stores the values in a double precision (#) array called V#(). Input is terminated with a null or negative value. We use string input to avoid the irritating "Redo from start" error message.

```
100 N%=0:CLS:DIM V#(17)
110 LINE INPUT "Please give me a
    number:";Q$
120 V#(N%+1)=VAL(Q$)
130 IF V#(N%+1)>0 AND N%<16
    THEN N%=N%+1:GOTO 110
```

Now we have an array of values to plot. We must find the total size of the pie (kept in V#(0)):

```
150 FOR I%=1 TO N%:V#(0)=V#(0)+
    V#(I%):NEXT
```

Next we must obtain the start angle and the end angle of each slice of the pie. The computer works in radians. Since we are limited to a radius of 30 dots, the circumference will be a maximum of 2 pi times 30 or about 200 dots, so this is a reasonable unit to divide the circle into. We could work in degrees, but the definition would be no better, and the calculations would take about twice as long.

The end angle of each slice is kept in the array EA%().

```
200     DIM EA%(N%+1):EA%(0)=0
210     FOR I%=1 TO N%
220     EA%(I%)=EA%(I%-1)+INT(200
        *V#(I%)/V#(0)+0.5)
230 NEXT
```

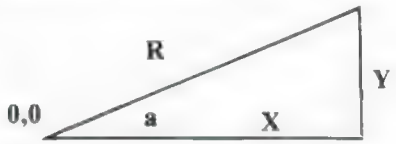
Now we have a series of end angles in units of 1/200 of a circle. All we have to do is plot the slices of the pie one at a time. Slice I% starts at EA%(I%-1) and ends at EA%(I%).

In order to plot a sector of a circle we must know not only the start angle and the end angle, but also the origin and the radius.

Since the LCD on the Model 100 is 240 cells wide by 64 cells high, the maximum radius we can have is about 30, the center of the screen is at X=120, Y=32. We set these at the beginning of the program:

```
10 R%=30:0X%=120:0Y%=32
```

It is simple geometry to plot a point at a certain distance from an origin at a certain angle. Figure 1 illustrates this for an origin of 0,0:



We remember from our geometry classes that

Y/R=SIN a , X/R=Cos a , Y/X=Tan a

Since we know R and a, we can get

Y=R Sin a X=R Cos a

For an origin other than 0,0 we simply add the offset, so that our equations become

Y=0Y+R*Sin(a) X=0X+R*Cos(a)

So now we can plot a segment by plotting the first point, joining it to the origin, then plotting a point at each unit position along the circumference to the last, then joining that last point to the origin. Bear in mind that our angles must be converted to radians by multiplying by a conversion factor (C# — we'll figure it out later).

```
1000 A%=EA%(I%-1):GOSUB 1100
1010 LINE (0X%,0Y%)-(X%,Y%)
1020 FOR A%=A% TO EA%(I%)
```

```
1030    GOSUB 1100:PSET (X%,Y%)
1040 NEXT
1050 LINE(0X%,0Y%)-(X%,Y%)
1060 RETURN
1090 '
1100 A#=A%*C#
1110 X%=0X%+INT(R%*COS(A#)
     +0.5)
1120 Y%=0Y%+INT(R%*SIN(A#)
     +0.5)
1130 RETURN
```

The subroutine at 1000 plots the segment, calling the subroutine at 1100 to get the XY coordinates of each point in turn.

It only remains to call the segment plotting routine once for each slice of the pie.

```
300 CLS:FOR I%=1 TO N%:GOSUB
    1000:NEXT
310 END
```

The conversion factor we left hanging earlier on is easily deduced from the knowledge that there are 2 pi radians in a circle, and 200 points in our pie's circumference. C# is therefore 2*pi/200 which simplifies to:

```
20 C#=3.14159/100
```

Following we present the program in its entirety for you to type into your Model 100. Keep in mind that the graphs produced by *Graph+* in the BUSINESSPAK+ software package are much more sophisticated, and are complete with labels and value representation.

```
10 R%=30:0X%=120:0Y%=32:C#=3.
14159/100
90 '
100 N%=0:CLS:DIM V#(17)
110 LINE INPUT "Please give m
e a number:";Q$
120 V#(N%+1)=VAL(Q$)
130 IF V#(N%+1)>0 AND N%<16 T
HEN N%=N%+1:GOTO110
140 '
150 FOR I%=1 TO N%:V#(0)=V#(0
)+V#(I%):NEXT
190 '
200 DIM EA%(N%+1):EA%(0)=0
210 FOR I%=1 TO N%
220    EA%(I%)=EA%(I%-1)+INT(2
00*V#(I%)/V#(0)+0.5)
230 NEXT
290 '
300 CLS:FOR I%=1 TO N%:GOSUB
1000:NEXT
310 END
990 '
1000 A%=EA%(I%-1):GOSUB 1100
1010 LINE(0X%,0Y%)-(X%,Y%)
1020 FOR A%=A% TO EA%(I%)
1030    GOSUB 1100:PSET(X%,Y%)
1040 NEXT
1050 LINE(0X%,0Y%)-(X%,Y%)
1060 RETURN
1090 '
1100 A#=A%*C#
1110 X%=0X%+INT(R%*COS(A#)+0.
5)
1120 Y%=0Y%+INT(R%*SIN(A#)+0.
5)
1130 RETURN
```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On The Road

By Robert Frowenfeld
PCM Contributing Editor

Here's a little program that will help you get from here to there the next time you are *On the Road.* Unlike last month's program, you really have to be on the road to make the most of the Model 100 program called *TRIP.* This program (see listing) not only performs the computations of those expensive "car computers," but also helps you plan your automobile trips, keeps track of your mileage and gasoline purchases, and even prints a report at the end of a long trip to tell you your total gas purchases and overall mpg's. Let's take a look at the five functions available and how to make the most of them.

Figure #1 displays the main menu with the available selections. The first function, *Miles per Gallon*—one tank computes the mileage obtained on one tank of gas. As shown in Figure #2, you enter the starting and ending mileage as indicated on your odometer, the price per gallon, and the amount of money spent. The Model 100 computes the actual number of gallons purchased; I find this to be a little more accurate than trying to read the number of gallons from the pump.

The second function assists you in planning your trip by computing your arrival time. As seen in Figure #3, the program prompts you for the current time, your current traveling speed, and the distance remaining—then instantly informs you of your estimated time of arrival.

The next function, *Speed to Arrive at Specified Time,* is my favorite. The Model 100 asks you for the current time, the time you want to reach your destination, the distance remaining, and the total duration (in minutes) of any expected delays such as traffic jams, toll booths, filling up the old gas tank, etc. It then responds with the speed you should maintain to arrive at the specified time (Figure #4). A word of advice: try and make your arrival time a reasonable number; even your Model 100 won't talk you into a speeding ticket!

Figure 2

```
Starting Mileage: 35245
Ending   Mileage: 35498
Price per Gallon: 1.249
Dollars Spent   : 20.00

Miles per Gallon: 15.80
```

Options #4 and #5 are used together to prepare a log of your gasoline purchases. Using an ASCII file named TRIP.DO, the program creates a data base of gas purchases to be used at the end of a trip to compute your overall miles per gallon figure. Option #4 asks for the date, price per gallon, and amount spent to fill up your tank. This can be used whenever you gas up. By creating the ASCII file, the purchase(s) are stored indefinitely and can be added to and/or displayed at any time. At the end of the trip (or any time you want), option #5 prepares a report which, if desired, can also be printed to an attached printer (see Figure #5). The report summarizes the gasoline purchases, prints the total mileage traveled, the total number of gallons purchased, and the overall mpg figure.

So this summer, take *PCM's* advice and carry your Model 100 along as your traveling companion and . . . happy motoring!

Figure 1

```
1) Miles per Gallon -- one tank
2) Compute Arrival Time
3) Speed to Arrive at Specified Time
4) Record Gasoline Purchase
5) Trip Report -- Overall MPG
6) End Program

Enter Selection:
```

Figure 3

```
Enter Time (hh:mm) : 10:30
Current Speed (mph): 60
Distance Remaining : 175

Est. Arrival Time  : 13:25  ( 1:25 pm)
```

Figure 4

```
Current Time (hh:mm): 8:00
Est. Arrival Time   : 11:00
Expect Delays (min) : 30
Distance Remaining  : 150

Maintain Speed of   : 60.00 mph
```

Figure 5

```
   Date      $/gal    Spent     Gallons
--------    -----    -----     -------
07/01/83    1.269    22.50      17.730
07/03/83    1.279    20.75      16.224
07/04/83    1.189    19.00      15.980
07/07/83    1.229    21.50      17.494

Total Mileage = 25430 - 23984 = 1446
Total Gallons =  67.43

Average MPG = 21.45
```

The listing:

```
5 CLS:DEFINT I-N
10 CLS
20 FOR I=1 TO 6:READ O$(I):NEXT I
30 GOSUB 820
40 F1$="#.###    ##.##      ##.###"
50 DATA"Miles per Gallon -- one tank","C
ompute Arrival Time","Speed to Arrive at
 Specified Time"
51 DATA"Record Gasoline Purchase","Trip
Report -- Overall MPG"
52 DATA"End Program"
100 CLS:FOR I=1 TO 6:PRINT USING"#";I;:P
RINT") "O$(I):NEXT I
110 PRINT@280,"Enter Selection: ";
120 A$=INPUT$(1):X=VAL(A$):IF X<1 OR X>6
 THEN 110
130 ON X GOTO 140,200,300,400,500,700
140 'tankful
150 CLS:PRINT@0,"Starting Mileage: ";:GO
SUB 800:SM=X
155 PRINT@40,"Ending   Mileage: ";:GOSUB
800:EM=X
160 PRINT@80,"Price per Gallon: ";:GOSUB
800:PG=X
170 PRINT@120,"Dollars Spent    : ";:GOSU
B 800:DL=X
180 PRINT@200,"Miles per Gallon: ";USING
"##.##";(EM-SM)/(DL/PG)
190 GOSUB 810:GOTO 100
200 'arrival time
210 CLS:PRINT"Enter Time (hh:mm) : ";:GO
SUB 800:J=INSTR(A$,":"):IF J=0 THEN 210
215 H1=X:M1=VAL(MID$(A$,J+1))
220 PRINT@40,"Current Speed (mph): ";:GO
SUB 800:SP=X
230 PRINT@80,"Distance Remaining : ";:GO
SUB 800:DI=X
240 PRINT@160,"Est. Arrival Time  : ";
245 H=DI/SP:M=60*(H-INT(H)):H2=INT(H)+H1
```


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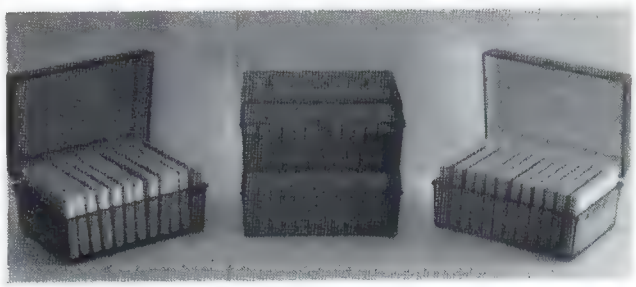

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```
;M2=M1+M:IF M2>=60 THEN H2=H2+1:M2=M2-60
250 PRINT USING"##:";H2;:IF M2<10 THEN P
RINT"0";USING"#";M2;ELSE PRINT USING"##"
;M2;
255 IF H2>12 THEN PRINT USING"  (##:## p
m)";H2-12;M2;
257 IF M2<10 THEN PRINT@192,"0";
260 GOSUB 810:GOTO 100
300 'speed
305 CLS:PRINT@0,"Current Time (hh:mm): "
;:GOSUB 800:J=INSTR(A$,":"):IF J=0 THEN3
05 ELSE H1=X:M1=VAL(MID$(A$,J+1)):IF M1>
59 THEN 305
310 PRINT@40,"Est. Arrival Time   : ";:G
OSUB 800:J=INSTR(A$,":"):IF J=0 THEN 310
315 H2=X:M2=VAL(MID$(A$,J+1)):IF M2>59 T
HEN 310
317 IF H2*60+M2<H1*60+M1 THEN 305
330 PRINT@80,"Expect Delays (min) : ";:G
OSUB 800:DL=X
340 PRINT@120,"Distance Remaining  : ";:
GOSUB 800:DI=X
350 PRINT@200,"Maintain Speed of   :";
360 TT=H2*60+M2-H1*60-M1-DL:TT=TT/60
370 RT=DI/TT:PRINT USING"###.##";RT;:PRI
NT" mph":GOSUB 810:GOTO 100
400 'trip gas purchase
410 CLS:PRINT@0,"Enter Date (mm/dd/yy):
";:LINE INPUTA$:DT$=A$:IF A$=""THEN100
420 PRINT@40,"Price per gallon     : ";:
GOSUB 800:PR=X
430 PRINT@80,"$ spent this purchase: ";:
GOSUB 800:DL=X
435 PRINT@170,"Entry correct (Y/N): ";:A
$=INPUT$(1):IF A$="N" OR A$="n" THEN 400
ELSE IF A$<>"Y" AND A$<>"y" THEN 435
440 PRINT#1,CHR$(34);DT$;CHR$(34)",";PR;
",";DL
450 GOSUB 810:GOTO 100
500 'trip report
510 CLS
520 PRINT@128,"Do you want output to go"
530 PRINT@168,"to a printer too (Y/N) :
";:A$=INPUT$(1):IF A$="n" OR A$="N" THEN
PT=0 ELSE IF A$="Y" OR A$="y" THEN PT=-1
ELSE 500
535 CLS:PRINT"Enter Trip Starting Mileag
e: ";:GOSUB 800:M1!=X
536 PRINT"Enter Trip Ending   Mileage: "
;:GOSUB 800:M2!=X:ML=M2!-M1!:TG=0
538 GOSUB 810
540 CLOSE:OPEN"TRIP.DO" FOR INPUT AS 1
545 CLS:PRINT"  Date     $/gal   Spent
  Gallons":IF PT THEN LPRINT"  Date
$/gal    Spent    Gallons"
546 D$="--------   -----   -----    ----
---":PRINT D$:IF PT THEN LPRINT D$
550 IF EOF(1) THEN 575
555 INPUT#1,DT$,PR,DL
560 GL=DL/PR:PRINT DT$;TAB(11);USING F1$
;PR;DL;GL:IF PT THEN LPRINT DT$;TAB(11);
USING F1$;PR;DL;GL
570 TG=TG+GL:GOTO550
575 PRINT:PRINT"Total Mileage ="M2!"-"M1
!"="ML:PRINT"Total Gallons ="USING" ###.
##";TG
576 IF PT THEN LPRINT:LPRINT"Total Milea
ge ="M2!"-"M1!"="ML:LPRINT"Total Gallons
 ="USING" ###.##";TG
580 PRINT:PRINT"Average MPG = ";USING"##
.##";ML/TG;:IF PT THEN LPRINT:LPRINT"Ave
rage MPG = ";USING"##.##";ML/TG
585 PRINT:PRINT
590 GOSUB 810
595 CLS:PRINT@122,"Kill Gasoline Purchas
e File (Y/N) ? ";:A$=INPUT$(1):IF A$="Y"
OR A$="y" THEN KILL"TRIP.DO":GOSUB 820 E
LSE IF A$<>"N" AND A$<>"n" THEN 595
599 GOTO100
700 'end
710 CLS:PRINT@125,"End of Model 100 Trip
 Planner":FOR I=1 TO 3000:NEXT I:MENU
800 LINE INPUTA$:X=VAL(A$):RETURN
810 PRINT@285,"Press any key to continue
 ... ";:A$=INPUT$(1):RETURN
820 OPEN"TRIP.DO" FOR APPEND AS 1:RETURN
```

PCM

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SOFTWARE

BUSINESSPAK+

Software For Serious Users

In one of the first offerings for the Model 100, the Portable Computer Support Group has assembled a group of business related programs into a single package called BUSINESSPAK+. Six main programs form the core of what could be considered necessary software for serious users, such as reporters, salesmen, managers and executives. The six programs and their respective memory requirements are as follows:

1) *WRITE+* — A screen and printer formatter used in conjunction with TEXT to enable real word processing. 4.1K
2) *EXPNS+* — A spreadsheet for expenses, budgets, etc., with 12 rows and 18 columns. 5.5K
3) *PUT+* — A screen formatting and data manager for mail lists, inventories and notes. 2.8K
4) *SORT+* — An alphabetic and numerical sorting routine for use with the data manager. 2.6K
5) *TELEX+* — Send TELEX messages or E-Mail with your Model 100. 3.9K
6) *GRAPH+* — A pie, bar and line graph generating program. 6.0K

Adequate instructions are given regarding memory usage as the above figures are the length of the programs and not their associated text files. Each core program, along with several ancillaries such as demos, is furnished on a separate tape enclosed in a 8½" x 11" binder with the instructions. By the way, the instructions are excellent for the beginning user. Step by step guides direct you through each phase of operation. Each program is saved three times for protection. We will examine the *WRITE+*, *PUT+* and *SORT+* programs in this review and cover the rest at a later date.

WRITE+

As you are aware, the M100 has an excellent text processor already. *WRITE+* enhances this editor with the addition of screen formatting. Three programs must be loaded from tape to use *WRITE+*, a text file, a BASIC program and a machine language program. After each tape load you must save the program to RAM using standard commands which are reiterated in the instruction manual. Functions supported by the program include lines per page, all margins, headers and footers, line spacing, page numbering, copies and output routing. Embedded print commands are supported with specific instructions for use with the DMP 100 and Smith Corona TP-1 printers.

One of the most interesting features was output routing. By using the proper response to the format prompt "output to:" you can route the text to any device desired. In my particular situation I was using a 2400 Baud serial printer connected to the RS-232 port. By answering the prompt with COM:67E1E all of the text was output to my "serial" printer in the initialized format. Output can also be routed to the parallel printer port (default) or only to the screen.

PUT+

A mini-data base program is always handy for any type of computer. *PUT+* provides a method of organizing mailing lists, inventories or even the NOTE. DO file corresponding to the SCHED function of the PoCo. Two programs are initially loaded to demonstrate the use of *PUT+*. One is the program written in BASIC and another is a sample screen format that could be used as a mailing list. Two other examples are available. Inventory and P+NOTE screen formats are supplied on the tape.

Custom formats are a snap with the instructions supplied and probably will be used more than the "canned" versions. As in the PoCo, editor searches can be performed for strings such as names or codes. Up to 16 information fields are supported, but you are limited to the 40 x 8 screen for each record. One feature that seemed to be missing was the ability to selectively print fields, such as mailing labels, from a record containing more information.

SORT+

After entering all of your data using the *PUT+* program you can load another program labeled *SORT+* to do exactly what it infers. Listings of up to 255 records can be sorted in 15 to 20 seconds. After entering the *SORT+* program you are prompted for the format of the file you wish to sort. You then move the cursor to the field you want to sort. After selecting the field, you are asked for the name of the data file. After your reply, as quick as you can say "sorted" you are asked for the name of the output file. I was impressed with this utility. Not only was it easy to use and well prompted, but it was fast.

Summary

I found only one flaw with the programs used in that selected printing of files does not seem to be supported in the *PUT+* program. I would not consider it major and the other features far outweigh any inconvenience. I think the entire package has a professional appearance with the user in mind.

—Dan Downard

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(continued from page 5)

And, yes, speaking of those who will be supporting PoCo, let me ask you to help us by mentioning our magazine when you do make inquiries or purchase products for your Portable Computer. Advertising, obviously, has a significant impact on *PCM's* ability to grow. That is simply because we can add more pages, buy more articles and do more interesting and unique things when we have more advertising.

We are basically committed to running 50 percent advertising and 50 percent editorial in each issue. Your help in encouraging advertisers will mean, simply, that we can have a bigger and better magazine. So, please do mention *PCM*. And thank you.

I would like to close by calling your attention to the *PCM Seal of Certification* which appeared for the first time in the premier issue last month.

The *Seal* is an extension of a program which has been highly successful in the Color Computer field. Simply put, display of the *Seal* certifies to you that we have seen and loaded a product which carries the *Seal*.

Since a large number of computer products, both hardware and software, are sold by mail order, the *PCM Seal of Certification* is your assurance that the product does, indeed, exist. Vendors are required to submit such products to us before they may display the *Seal*.

No, the *Seal* is not a guarantee that you will be satisfied with the product. But it *is* a certification that the product does exist and is available. We make great effort to police the *Seal* and will appreciate your notifying us of any instance of violation of its use. We will publicize violations here, in *PCM*.

Once the *Seal* has been awarded, a vendor is allowed to use it on his own sales literature, on his packaging and in his advertisements. In the Color Computer field, we have been very pleased that practically every publication which accepts advertising allows its advertisers to use the *Rainbow Certification Seal* because of its public service benefits. We assume this cooperation in the interests of consumer protection will be part of the PoCo world as well.

—Lonnie Falk

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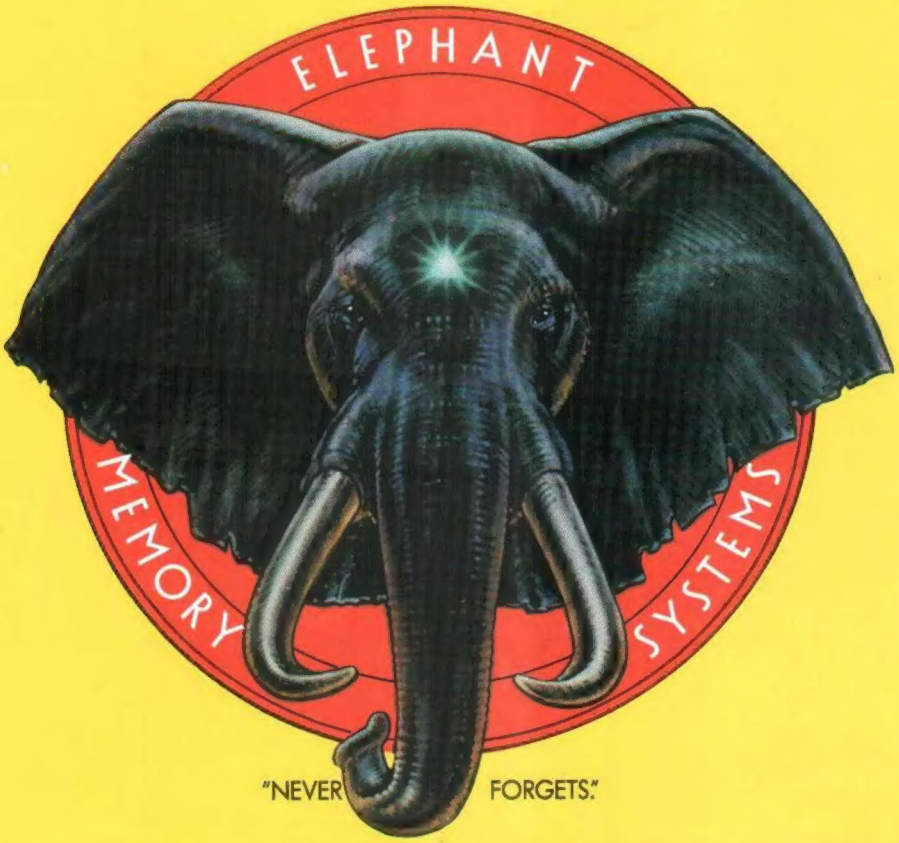

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